sider what should be their attitude towards the new body. Accordingly, at a very full meeting of convocation (as the general body of graduates above a certain standing is termed) last summer, the whole subject was referred to a special committee of forty (of which the present writer was a member), to consider and report. This committee appointed Lord Justice Fry its chairman, and a scheme was by it prepared for the re-organization of the existing university from the points of view of the new association, — a task the more easy, as several gentlemen were members of both bodies. At an adjourned meeting of 'convocation' held on Dec. 8, this scheme was rejected, and, as the former committee refused to act, another committee of twenty-five was appointed to modify it in the sense indicated by convocation.

The year which is now drawing to a close has been marked by greater losses to English biology than any since 1882, which witnessed the deaths of Mr. Darwin, Prof. Francis Balfour, and Sir Wyville Thomson. Prof. Morrison Watson was a well-known anatomist of hardly more than middle age; while Drs. W. B. Carpenter, J. Gwyn Jeffreys, and T. Davidson were almost the last of that older school of zoölogists who are too often looked down upon by the younger generation which has been trained to minute histological work. Dr. Davidson had the happiness of completing the work to which he had devoted the labors of a long life; but his two old friends have left much material behind them, the working-out of which must be completed by other hands. Dr. Carpenter's loss will be severely felt by those who believe in the organic nature of eozoon. He had accumulated a very great amount of material, which was regarded by all to whom he had shown it as proving his case in the most satisfactory manner possible.

An important reform has just been carried out at Oxford. Honor candidates in law, history, and science, will henceforth be excused from the classical examination at the end of their first, or the beginning of their second, year, which is known as 'moderations.' The preliminary examination 'responsions' can be passed before residence begins, either in the leaving examination of a public school or at the university itself; and men can therefore specialize during the whole of their university course, instead of having their attention distracted from physics, chemistry, or biology by the necessity of getting through 'mods.' This has long been the case at Cambridge, and is one of the reasons for the overflowing state of its medical school.

The old public schools are also beginning formally to recognize that there are other branches of education besides the classics. Rugby is about to institute a modern side; and changes in the same direction are being gradually introduced at Eton, her great rival, Harrow having long had something of the kind. The committee of the city and guilds of London institute for the advancement of technical education have offered free studentships of the annual value of thirty pounds, tenable for three years at the central institution, to be awarded by the head master of each of the principal public schools. It will be a matter of some interest to see what proportion of boys will avail themselves of these opportunities for obtaining the higher technical education.

W.

London, Dec. 17.

LETTERS TO THE EDITOR.

***, Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

The moon's atmosphere.

MY friend, Professor Langley of Allegheny, has recommended to me to give you an account of a phenomenon twice observed by me on the occasion of two occultations of Jupiter. At the moment of contact, the planet, instead of passing behind the moon, appeared to be projected upon the moon's edge, until nearly or quite one-half of the disk of the planet was visible on the moon's surface. Then suddenly the whole planet disappeared behind the moon. As this phenomenon must be due to refraction, it would indicate a lunar atmosphere. The instrument with which I observed the occultation was a telescope made for me by Alvan Clark, with a four-and-a-half inch aperture. JAMES FREEMAN CLARKE.

Jamaica Plain, Mass., Dec. 31.

Demand for good maps.

Your comments in the number for Dec. 18, on the character of our small maps, are to me very welcome, and I hope you will follow the subject up till some decided impression is made on the minds of the publishers. The maps in our school geographies are, to me as a teacher, a constant source of vexation. Indistinct, incomplete, inaccurate, they baffle attempts at close work, and so compel, if solely depended upon, a very elementary grade of work. The small *schul-atlas* that a German boy buys for twenty-five cents is worth ten times as much as our best geography maps.

You spoke of old plates. I have seen within two years a wall-map of North America in which the Yukon River had not been drawn. Said map was shown as a sample in the office of one of our largest publishing-houses.

When the German publishers bring out their work so perfect, it seems as if the material was provided for American geography-makers. Is the reason they do not use it because, with German lettering, the maps cannot be reproduced by the photographic process and be available? Or are they afraid of repeating the mistake of one of our atlas-makers, who produced a town in Africa called Elfenbein?

However it may be, we do need better school-maps.

They should be maps in which the various features of surface are clearly, carefully, and fully drawn. I do not mean maps full of names, but full of features. To illustrate: Where are the Alps? The Alps are in Switzerland; and the schoolboy finds on his map 'Alps' printed on the south side of that portion labelled 'Switzerland.' A good map would show at least four ranges there; and proper maps of Austria, Italy, and France, would teach him that 'Alps' is a generic term with at least thirteen applications in southern Europe.

Norway and Sweden appear on most school-maps with but one or two rivers, because, I suppose, there is no long and large stream there important enough to have its name memorized; but what an idea does such a map give of that country? I can count over sixty rivers there on a map in Andree; and enough of them should be drawn, even if without naming, to show the true character of the surface.

Similar instances could be given by the dozen. But I want to take up another point. When are we to see a geography with an index? Studying geography by the topical method, an index is well-nigh indispensable. By any method, twice as effective work can be done if the material can be viewed from the stand-point of the kind of feature, production, occupation, or race, as well as in relation to this or that political subdivision.

I do not think it too much to insist on, that every ocean, sea, gulf, bay, strait, channel, lake, sound, harbor, canal, river, waterfall, bight, firth, bayou, roadstead, etc.; every land feature, every product, occupation, language, religion, form of government, town and political division, — in short, every thing namable that has been mentioned in the text or appeared by name in the maps, — should be indexed by page or section, and, in case of map features, with latitude and longitude.

Why, even in Morden's 'Geography rectified,' published in 1693, there is a copious index, not to mention later works (1809, 1831) likewise favored.

With an index to aid him, a scholar can classify, compare, and infer; and the value of the text-book would be doubled.

Nor would it be difficult to mention other ways in which our geographies could be improved. But if we can first have some better maps and an index worthy the name, we shall have gained much. I hope you will not be content with a few leaders. The matter is one of no slight importance. Perhaps, if our publishers read Prince Kropotkin's article in the December number of the *Nineteenth century*, they would be inspired to do better. Let us hope they will.

C. H. LEETE.

New York, Dec. 31.

The temperature of the moon.

Mr. Langley does not seem to have examined my condition for determining the moon's temperature with sufficient care. It is true that in the equation a moon of maximum radiating power was assumed; but it had been first shown that the temperature of such a moon must be the same as that of any other, provided the relative radiating and absorbing powers are the same, as is usually assumed. The equation is between the absolute rate of radiation and absorption of heat, in which r, the relative radiating power, enters as a factor on the one side, and a, the relative absorbing power, on the other. If these are equal, of course they can be omitted, which is the same as using unity as the relative radiating and absorbing powers, and so the same as assuming that the moon has a maximum relative radiating and absorbing power. The relative radiating and absorbing powers, and the proportion of heat reflected, do not, therefore, come into the condition at all. It cannot be said with propriety that the moon loses heat by reflection, as stated by Mr. Langley; for the reflected heat has not been appropriated by absorption, and therefore cannot be said to be the moon's heat. It has come to the moon's surface and been rejected, and it has nothing to do with its temperature. The condition which determines the static temperature is, that the rate with which heat is radiated must be exactly equal to that with which it is absorbed. When this is the case, there can be neither increase nor decrease of temperature.

But perhaps this matter will be more readily comprehended by looking at it in a less mathematical way. We have a moon, say, with a surface of maximum relative radiating and absorbing power, and with a temperature below the static temperature corresponding to the rate with which it is receiving heat. With this temperature, the absolute rate with which the moon radiates heat is less than that with which it is receiving and absorbing it, and the difference goes toward raising the temperature of the body. But as the temperature increases, and with it the rate of radiating heat, though not proportionally, it after a time rises to that temperature at which the rate with which heat is radiated from the moon is exactly equal to that with which it is received and absorbed by it, and its temperature then remains stationary. This, expressed in a mathematical form, is the equation of condition.

But now suppose that the moon's surface is such that it radiates and absorbs heat at only half, or any other proportion, of the rate that one of maximum relative radiating and absorbing power does. Our condition is still satisfied; for although the moon's surface now is radiating heat at a rate which is only half, or any other assumed proportion, of what it was before, it is also absorbing at only the same rate, whatever it may be, and there is no change of temperature needed to satisfy the condition of static temperature. Hence, so far as the static temperature of the moon is concerned, it is no matter what part of the heat received is absorbed, and what reflected; these being complementary to each other, and both together equal to the heat radiated by a moon of maximum relative radiating power, under the condition of a static temperature. Of course, our condition for determining the temperature is not applicable where there is a rapid increase or decrease of temperature.

WM. FERREL.

Washington, Jan. 4.

Yankee.

In a paper upon the origin of 'Yankee Doodle,' read lately before the New York historical society, Mr. George H. Moore states that the word 'Yankee' is pure Dutch. 'Yankin,' he says, in the vocabulary of the early New York Dutch, meant 'to grumble, snarl, or yelp,' and its derivative noun meant 'a howling cur.'

But where did the New York Dutch get the word? I think from the Indians. Peter Martyr says that Sebastian Cabot named the coasts of Newfoundland and thereabouts the land of baccalaos, because in the seas he found a multitude of large fish which